Productivity of Australian Dentists

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Executive summary

Measures of dentists’ productivity take on particular importance when developing projections of the supply and demand for dental services over a number of years, say to 2020. Together with the likely growth of the dental workforce, the growth in dentists’ productivity determines the supply of dental services that will be available at some point in the future. The higher the growth in dentists’ productivity for any given level of demand for dental services the less will be the need to increase the size of the dental workforce.

The Australian Research Centre for Public Oral Health (ARCPOH), which has been the primary source of projections of demand and supply for dental services in Australia, relies on the number of visits supplied per dentist per year as the measure of dentists’ productivity. Over time this measure of dentists’ productivity has been falling.

Our report demonstrates that the ARCPOH preferred measure of dentists’ productivity is flawed conceptually and produces highly misleading results that have the potential to compromise their projections of the dental workforce needed in the future to meet the likely demand for dental services.

A better measure of dentists’ productivity needs to take explicit account of the services being provided by dentists given that over time the mix of services provided has been subject to considerable change both in terms of the number and types of services being provided.

Our analysis based on a study of the literature and interviews with a sample of dentists strongly suggests that dentists’ productivity in Australia is growing by between 0.75 to 1.25 per cent per annum. This result is in line with the results obtained by a major study of dentists’ productivity conducted in the US by Beazoglou et al (2002).

When account is taken of the factors that are driving the increase in dentists’ productivity – technological change introduced via new equipment used chair side and new materials, increasing skills of dentists, the employment of allied dental practitioners and the introduction of new business models for running dental practices, even allowing for some fall over time in hours worked by dentists per week the growth in dentists’ productivity is likely to continue in the future at rates at least as high as those seen in the past. Dentists are working smarter if not harder over time. This needs to be taken into account in estimating future dental workforce needs.

To improve the public debate about the existence or otherwise of projected shortfalls in the dental workforce (and hence public policy responses) it is important that a sounder and more representative measure of dentists’ productivity which takes into account dental services being provided should be calculated and used in place of the currently used measure of visits serviced by dentists per year.
CHAPTER 1

Objectives of this project

1.1 Scope of the study

Our previous study, Insight Economics 2012, *Review of the Dental Workforce Supply to 2020* identified the importance of the productivity of dentists to the actual supply of dental services that would be associated with a given level of the dental workforce. It noted that, as is often the case when services are involved, the measurement of the productivity of dentists was by no means straightforward.

In the literature that has developed in Australia on the demand and supply for dental services, a particularly significant contribution has been made by the many publications by the Australian Research Centre for Population Oral Health (ARCPOH) in the School of Dentistry at the University of Adelaide. ARCPOH has to date been the main source of projections of demand and supply for dental services and general studies and analysis of the Australian dental market.

Quite apart from projecting the demand for dental services and the supply of the dental workforce, ARCPOH has also sought to provide projections of productivity. These projections are based on a very simple concept of productivity as the number of visits supplied in a given time period by dentists. By this measure, dentists’ productivity has tended to decline over time as the time worked by dentists per year has fallen and the number of visits per unit of time has also fallen. Consequently, the need for dentists to service any given overall level of demand is tending to rise to offset the loss in measured productivity.

A key purpose of this study is to examine closely the measure of productivity which economic theory suggests is appropriate and to evaluate practical measures of the productivity of dentists. As well, the study looks at the implications of adopting different measures of productivity.

At the outset it should be said that the preferred ARCPOH measure of productivity suffers, as ARCPOH itself recognises, from some very serious shortcomings. The main problem is that patients do not attend dentists for the purpose of making a visit but to obtain dental services. This would not matter so much if over time the mix of services being provided in dental visits tended to remain the same. But the reality brought out very clearly in a series of ARCPOH studies is that the mix of services provided has tended to change very considerably over time.

This strongly suggests that a better measure of productivity is needed which pays regard to the mix of services that dentists are providing and how that has changed over time. This matter is a strong thread through this report.
1.2 Sources of information

This study draws upon the three key elements of the *Dental Practice Survey 2010* conducted by the Australian Dental Association, namely Productivity of dentists, Provision of services by dental practices and Financial aspects of private practice. (The documents are listed in the References at the end of the study.) These publications present a wealth of data relevant to dentists’ productivity, the mix of dental services and the key drivers of productivity.

This report also draws upon a number of studies of the supply and demand for dental services that have been carried out by ARCPOH which relies upon a measure of dentists’ productivity which is the number of visits provided per dentist per year. As suggested above, on the basis of this measure, ARCPOH finds that dentists’ productivity is tending to decline.

In addition to Australian sources, our study also looks closely at the international literature that has emerged, especially in the US, dealing with the subject of the productivity of dentists. The clear conclusion of this literature is that the productivity of dentists, when measured in terms of the relationship between real output and real inputs, has been increasing over time.

This is an unsurprising result given that productivity in most activities throughout developed economies has tended to increase over time in response to factors such as new technology associated with new equipment and procedures, new materials, complementary factors of production, better business models, education and training and the availability of economies of scale and scope.

Generally speaking, an increase in labour productivity in developed countries in the range 1 to 2 per cent per annum has occurred over extended periods. This applies to both goods and services, although it is well understood that the measurement problems with industries producing services is greater than it is for those producing goods. This is particularly the case for services that have no market value, such as many government services including defence.

We have also sought to complement information and analysis available in the literature with a series of interviews with a small number of dental practices in Australia ranging from the classic one person dental practice to larger, group practices with a number of dentists and allied dental practitioners. These interviews allowed us to obtain a deeper understanding of the changes in the mix of services being demanded and delivered over time, the work practices of dentists and sources of greater productivity available to dental practices.

1.3 Structure of the report

Our report is structured as follows:

- Chapter 2 examines the concept of productivity, possible measures of productivity and data needs
- Chapter 3 identifies the drivers of productivity growth with special reference to dentistry
• The measures of productivity that have been applied to the dental profession are analysed in Chapter 4.

• In Chapter 5 we present our findings on the growth of productivity of Australian dentists and make some suggestions about possible future work on this important subject.

• The published studies we have referred to in the report are set out in Appendix 1.
CHAPTER 2
The concept of productivity

2.1 What is productivity and why is it important?

Society’s needs are met by the production of goods and services. In order to produce goods and services, inputs of one kind or another, such as labour, capital and land, are required.

Productivity is the efficiency with which an economic activity transforms inputs into outputs. The higher the efficiency, the greater the productivity and hence the greater the output that can be achieved from a given set of inputs. Its importance for economic development and hence living standards is hard to understate. Paul Krugman (1992), the Nobel Prize winning economist, has captured this thought in his oft-quoted statement that “productivity isn’t everything, but in the long run it is nearly everything”.

The thinking underlying this statement is that for a given workforce, the gains over time in efficiency and hence living standards will come primarily from increased productivity. While, as we have seen recently, a resource rich country like Australia can boost its living standards for a time on the basis of higher prices for its resources in international markets, this is not sustainable in the longer term. At some stage supply catches up with demand and prices will stabilise or even fall. At that point increasing productivity once again becomes the main base for maintaining and eventually increasing living standards.

At the level of individual businesses, productivity growth allows businesses and the people that work in them to better meet the needs of their customers, compete with their competitors, support the payment of increased wages and profits over time and in the longer term allow working time to be reduced.

2.2 Measures of productivity

The simplest and in many ways the most common way of measuring productivity is to relate real output to the amount of labour used in its production. Output may be measured in terms of volumes (for example, the production of one tonne of coal) or the value of that output in real terms (that is, measured at constant prices). Labour inputs are generally measured in terms of hours worked. This calculation produces a measure of labour productivity.

Some of the gains in productivity tend to come from the education and training of the workforce. This generally increases the amount of human capital that can be employed in the production process. These gains in human capital, or the quality of the workforce, are associated with the labour input.

In practice, however, capital accumulation and the development of more efficient capital equipment have been major drivers of higher output in developed
countries. New generations of capital equipment have been a primary way of introducing new technologies that are embedded in the equipment itself and enabling larger scale production. New technologies can also be in a disembodied form such as blueprints and know-how.

The importance of capital to output has led to attempts being made to measure capital productivity as well as labour productivity.

A further and more complex measure of productivity is called total factor productivity which attempts to account for increased inputs of both labour and capital in producing greater output and ascribing the residual unexplained growth in productivity to “pure” or total factor productivity. The elements caught up in the “residual” (i.e., the amount of output gain not explained by inputs of labour and capital) are things such as improved business organization methods (e.g., craft production being replaced by mass manufacturing and more recently lean manufacturing) and other sources of innovation.

The computation of measures of total factor productivity requires the specification and estimation of a production function for the good or service being considered. This helps to ensure that the contribution of the key elements of labour and capital and the residual are identified and reflected in the calculations.

While recognizing the different types of ways productivity can be measured, in this study we have focused attention on labour productivity.

### 2.3 Data requirements

The most challenging part of making productivity measurements is to obtain relevant measures of real output. This can be relatively straightforward with activities such as mining iron ore where the relevant measure of output is tonnes of iron ore mined, growing wheat where the relevant measure of output is bushels of wheat grown and producing steel where the relevant measure is tonnes of steel produced.

Even in these examples real life measurement of output can become much more challenging if multiple grades and types of these products commanding very different prices occurs. There is an aggregation problem which needs to be addressed.

Obtaining a relevant measure of real output in some services industries tends to approximate the situation facing the goods producing industries mentioned above. For example, logistics where the measure of real output could be tonnes of load transported in a given time period.

However, in a number of services industries where the outputs are less tangible obtaining a measure of real output is rather more challenging and compromises inevitably have to made. One method that has been adopted is to establish real output by dividing a price index into a measure of the value of output. Other approaches have tended to involve finding a relevant proxy measure.

Typically, the data requirements of establishing measures of real inputs for measuring labour productivity tend to be less problematic. This involves counting
the number of labour units available in a given time period. A typical measure is hours worked.
CHAPTER 3
Drivers of productivity growth

3.1 Technological progress

Over extended periods of time technological progress has been the major, though by no means the only, contributor to increased productivity in most industries.

Technological progress can make itself felt through two main channels: embedded technical change represented in new generations and breeds of capital equipment and disembodied technical change reflected in blueprints and know-how. Both have been important but given the capital intensive nature of a dental surgery embedded technical change is likely to have been of major importance.

Placing this in the dental context, over time the kind of capital equipment in broad use by dentists has changed very significantly. The expectation is that it will continue to change in the future, driven by progress in the equipment making industry.

In the 1960s and 1970s, technological progress was introduced in terms of much faster drills that allowed teeth to be drilled much faster and with much less discomfort involved for patients. In more recent times, technological progress has been introduced, for example, with digital radiography machines where digital X-ray sensors are used instead of photographic film. Digital radiography can be used by dentists to have X-ray equipment available to them chair side, which can quickly produce highly readable X-rays that can be readily stored digitally and transferred easily. Lower X-ray doses are involved for patients. Modern Rotary Endodontic instrumentation with electronically controlled force and rotation speed has made endodontic procedures much more productive in terms of time. In the future it is likely that laser technology will become a source of increased productivity. A number of dentists interviewed also made special reference to lighting systems now available which enable them to do higher quality work.

CAD/CAM dentistry has been on the horizon since the 1980s and is gradually being taken up as the capital costs fall and the accuracy of the results obtained starts to match and in some cases better those that can be attained by more traditional methods for making bridges and crowns. The widely held view is that the rate of take-up of CAD/CAM dentistry is likely to accelerate.

The ADA 2010 (3) found in its Survey of Dental Practices 2010 that 60 per cent of dentists use a computer at chair side and that clinical use of computers has increased greatly over the last decade. The computer is now used for: charting by 62 per cent (52 per cent in 2007); photography by 55 per cent (50 per cent); radiographs by 64 per cent (47 per cent); and digital models by 14 per cent.
In terms of office functions, the ADA 2012 (3) estimates that almost 90 per cent of dental practices operate computer-based systems for record keeping, billing and scheduling. One practice management program used by 25 per cent of Australian dental practices has been gradually improved since its introduction in the late 1980s and is now in its ninth variant. Amongst other things, this and similar programs can assist in better scheduling of patients and the reduction of down time by dentists. ICT equipment is a driver of productivity in most industries – dentistry is no exception.

3.2 New materials

The potential for new materials to be used in dentistry is considerable and they will have a positive impact on productivity, as has already been witnessed. Probably the most striking change in the use of materials by dentists has been the increasing use of ceramics for fillings. This change has been driven in part by the evolving consumer demand for whiter teeth. The additional value perceived by patients can be considerable.

In other areas, CAD/CAM digital manufacturing processes are being introduced as an integral part of new technology offering better quality products that can be produced much more efficiently in terms of time than if made by traditional methods.

3.3 Skills

Education and training contribute over time to increasing the skills available to dentists and allied dental practitioners. These higher level skills reflect themselves in greater productivity and higher quality work.

As mentioned in the discussion on technological progress, while an important channel for introducing new knowledge is by way of new generations and types of capital equipment new knowledge can also be introduced through the workforce itself. This can come through education and training, but also through on the job learning.

3.4 Allied dental practitioners

There has been an increasing tendency over time for dental practices to employ allied dental practitioners, such as dental hygienists, to undertake some of the functions previously provided by dentists. The advantage of this development is that it allows the dentists to concentrate on the more complex and higher value work and hence use their time more effectively. This has the effect of increasing the productivity of dentists albeit at the cost of employing allied dental practitioners. If both dentists and allied practitioners can be kept fully employed, however, then the overall efficiency and productivity of the practice should increase.

3.5 Business models

Increasing awareness of best practice management techniques for operating sole dentist practices through the adoption of improved business systems and
associated computer based management tools has led over time to better time management and scheduling. This in turn has contributed to lifting dentists’ productivity. Operating as sole dentist practitioners remains the most significant part of the private dental system. But there are signs of change both in the US and Australia in this respect.

Over time there has been a tendency to move away from the dominant single dentist model towards group practices and even in some cases relatively large commercial practices. Group practices potentially have some special advantages not the least being that they allow dentists who do not wish to work a full week (a significant proportion of whom are females with children) and /or to become partners to be in the workforce in a manner appropriate to their needs.

As mentioned above in 3.4, larger practices also create a situation in which allied dental practitioners can be fully integrated thereby allowing dentists to focus on more complex and higher value added tasks.

### 3.6 Busyness

There is a general tendency for labour productivity to fall during downward cycles in the general economy when the demand for discretionary services falls. As in many activities, employment levels tend to fall less than demand, which results in a degree of under-utilisation of available capacity. To put this another way, the busyness of dentists falls, which in turn tends to reduce measured productivity. This is a cyclical rather than a structural result and can be expected to reverse itself once the economy returns to its normal growth trajectory.

### 3.7 Hours worked by dentists

As well as a cyclical movement in time worked by dentists per unit of time, there may also be a tendency over time for a structural shift to occur towards working less hours per unit of time, e.g., per week and/or per year. This has been a trend that is notable in advanced economies generally as the length of the working week has fallen, and the number of holidays taken has increased. Changing the life-work balance is one way in which the gains of higher productivity have been taken out.

According to ADA 2012 (1), while the weeks worked per year were fairly constant, hours worked per week were 40.4 slightly less than previous years (41.2). More time will need to pass to see whether this change is part of a cyclical adjustment to a lesser level of busyness associated with the GFC or a more structural change.

Generally speaking, productivity is about working smarter rather than working longer. The first five drivers discussed in one way or another involve working smarter. In the long term this is what is primarily important for dentists’ productivity growth.
CHAPTER 4
Measuring dentists’ productivity

4.1 Scope
Our purpose in this chapter is to set out and review the measures of the productivity of dentists that have been used both in Australian and US studies.

Because of the difficulties in measuring the conceptually correct concept of productivity as real output per unit of real input, a range of other measures have been used in practice.

The main one used in Australia by ARCPOH in their studies of demand and supply projections for dentists is the number of visits supplied per dentist over a given time period.

In the case of US studies of dentists productivity two main approaches can be identified:

- calculating resource based relative value measures as a proxy for dentists’ productivity
- specifying a production function for dentists and using expenditure and pricing indexes to arrive at estimates of productivity of dentists.

4.2 Dentist visits measure (ARCPOH)
The measure of dentists’ productivity used by ARCPOH is the number of visits supplied per dentist per unit of time.

Using this measure ARCPOH finds that the productivity of dentists has tended to decline due to both the shorter time supplied by dentists per annum and the number of visits supplied per unit of time.

The implication ARCPOH has drawn in terms of their projections of dental supply and demand is that for any given level of demand the required number of dentists will tend to be greater because of declining productivity.

ARCPOH recognise that their measure of productivity is far from being perfect but their fall back position is that it is the best available measure.

The main problem with the ARCPOH visits measure is that it assumes that the nature of the bundle of services provided per visit remains broadly the same over time. This is not the case as has been documented very well by work ARCPOH itself has undertaken (see ARCPOH 2006).
The mix of services provided by dentists has changed very considerably over time. In general terms, there has been a movement away from treating patient pain and producing/fitting dentures towards diagnostics, preventative work, restorative and cosmetic work.

This accords with the findings of US studies. Beazoglou et al (2002) found in their US study that:

The mix of service patients receive has changed significantly, with large increases in diagnostic, preventative and cosmetic services and equally large reductions in extractions, restorative care and provision of full removable dentures.

There is also evidence in Australia that the length of time dentists are spending with individual patients per visit is longer, the number of services being provided per visit is increasing and the complexity of what is done is also rising.

Important drivers for the mix of services include:

- the effects of water fluoridation in reducing dental decay
- the ageing population, with many people retaining most of their teeth into older age
- rising incomes and tastes, increasing the demand for cosmetic dentistry.

The upshot of the significant changes in the mix of services being provided per visit is that a productivity measure which relies purely on number of visits is highly likely to be misleading at best and totally inadequate at worst. Developing a better measure strongly suggests that the mix of services has to be taken into account.

### 4.3 Accounting for the mix of services

Relevant to the measurement of productivity is the work that has been done in the US to develop improved methods for reimbursement of dentists under Medicare and State Government health schemes.

Starting in the late 1970s and in particularly at the Harvard School of Public Health by Professor Hsiao published in the New England Journal of Medicine (Hsiao et al (1988)) a lot of work was done on developing Resource-Based Relative Value Units (RBRVUs) as a basis for the remuneration of dentists which better reflected their productivity.

Each service was then allocated a number of RBRVUs. The RBRVUs were derived by considering the following 6 elements:

- Time taken for procedures
- Skill requirements
- Risk to patients
- Dental-legal risks to the practitioner
- Severity of the problem
- Uniqueness of supplies used not separately billable.
The RBRVUs then computed were used to calculate reimbursement rates to ensure a common base was being used to judge performance. But they potentially could also be used to develop measures of dentists’ productivity.

Short of doing a lot of work to construct such RBRVUs in Australia, some account at least of changes in the mix of services can be made by adding in the number of services provided per visit to the ARCPOH visit measure. In their report *Projected demand for dental care to 2020*, ARCPOH found that the number of dental services supplied per dental visit has increased by one-third over the period 1983 to 2003, with the largest increases being for diagnostic, preventative and endodontic services. This finding was based on data that was collected in the Longitudinal Study of Dentists’ Practice Activity (LSPDA). The LSPDA collects data from a representative sample of dentists at five yearly intervals, the most recent one being in 2008-09.

While direct evidence is lacking, the anecdotal evidence strongly suggests that as well as the number of services per visit increasing, there has also been an increase in the complexity of and hence level of skill required for the dental services provided.

An important aspect of dental practice that has added to the complexity and quality of dental care has been the effort that has been applied over the past 20 years or more to improve infection control. The Australian Dental Association Guidelines for Infection Control 2012 represent an up to date statement of best practice in this respect.

The adoption of best practice in infection control by dental practices has come at a cost and may also have reduced throughput. But is has raised the quality of dental services being provided. One aspect of infection control has been a tendency for dental practices to program longer times for visits with more services being provided to ensure optimal outcomes. Better infection control tends to reduce visits per unit of time, but more services are provided per visit with a higher quality outcome.

On the face of it, once allowance is made for changes in the mix of services provided a strong case can be made that, unlike the situation shown with dental visits supplied, the amount and value of dental services provided per dentists per year has been increasing steadily over time and hence dentists’ productivity and the quality of services provided has almost certainly increased in line with developments in the economy more broadly.

### 4.4 Economic modelling of productivity

The most significant estimate of dentists’ productivity in the US was that done by Beazoglou et al (2002) which was published in the Journal of the American Dental Association.

The data sources used by Beazoglou et al were:

- The American Dental Association provided data on the number of professionally active dentists in the US and gross billings from dental practices
The US Federal Government provided access to data on dental care expenditures and prices.

Dental output was measured by national dental expenditures deflated by the dental component of the Consumer Price Index for each year during the period 1960 through 1998.

Dentist productivity was then estimated using two approaches:

1. The total dental output divided by the total number of professionally active dentists
2. The gross billings per dentist from annual surveys of dental practice.

On the basis of the first measure and using regression analysis, Beazoglou et al then estimated that dentists’ output per hour grew at an average annual rate of

- 3.95 per cent from 1960 through 1974
- 1.3 per cent from 1974 through 1991
- 1.95 per cent from 1991 through 1998
- 1.41 per cent from 1960 through 1998.

On the basis of the second measure, using the American Dental Association practice survey data Beazoglou et al (2002) calculated the annual rate of growth of dentists’ productivity to be 1.05 per cent from 1991 through 1998.

While the estimated rate of productivity growth per annum seems relatively small, if continued over a 20 year period it makes a very significant impact on satisfying the potential increased demand for dental services. This is brought out by the results presented in the following paragraph.

In 2000 there were 59 professionally active dentists per 100,000 people in the US (166,049 dentists in a population of 281,421,906) which is about where Australia now stands. Beazoglou et al (2002) estimate that at a 1.05 per cent per annum rate of growth in dentists’ productivity that would be equivalent in the productive equivalent of dentists over 20 years of an additional 38,578 dentists. This would be more than enough to satisfy the additional demand for dentists they estimate would be needed to 2020.
CHAPTER 5

Findings

5.1 Beyond visits as a measure of productivity

The use of visits per dentist per year as the measure of dentists’ productivity has very considerable shortcomings, both on conceptual and operational grounds. It is highly likely that its use to project the total supply of dental services leads to substantially misleading results and a major and systematic underestimation of real productivity growth.

When account is taken of the way the mix of dental services has been changing over time and the influence of the fundamental drivers of dentists’ productivity, it is highly likely that dentists’ productivity far from falling has been increasing over time in line with increases in productivity in the economy more generally and in the services industries in particular.

The use of visits as the measure of dentists’ productivity also has the effect of shifting attention away from the actual drivers of dentists’ productivity. As we have seen, these include technological change, both embedded in new capital equipment (chair side and in offices) and people; increasing skill levels; the use of allied dental practitioners; and changing business models used in dental practices.

The review of the literature both in Australia and the US strongly suggests that a better measure of dentists’ productivity is needed than visits supplied per dentist per year. Such measures need to take full account of the changing mix of services provided, the increasing complexity of dental work and the higher value of dental work perceived by patients.

The Longitudinal Study of Dentists’ Practice Activity, which takes place every five years, obtains measures of the number of dental services provided per visit. At the very least including this element as part of the dentists’ productivity measure represents a practical way of giving recognition to the services provided during visits. As ARCPOH (2008) found, the number of services supplied per dental visit has increased by one-third (33%) over the period 1983 to 2003.

In practice, making this change alone probably is on the conservative side as regards real productivity growth. Making a suitable allowance for increasing complexity (and quality) of services provided would tend to lift further measured dentists’ productivity in terms of services provided and give a better picture of what is actually happening.
5.2 Likely rate of dentists’ productivity growth

Labour productivity tends to increase at a long term average rate of around 2 per cent per annum in developed countries like Australia. This reflects productivity growth in both the goods and services producing sectors of the economy.

Even allowing for a somewhat lower labour productivity growth rate in labour intensive services such as dentistry, it is likely that a rate of growth of productivity of about 1 per cent per annum occurs in most years except those where the economy is in a cyclical downturn when measures productivity may in fact fall somewhat.

This is very different to the negative rate of dentists’ productivity growth proposed by ARCPOH on the basis of their productivity measure of visits supplied per dentist per year.

The most detailed and economically sophisticated modelling work done on estimating dentists’ productivity in the US suggests that in the longer term dentists’ productivity is increasing by a touch over 1 per cent per annum. In some periods in the past 40 years the rate of productivity growth has been rather higher and in others when the general economy was performing well away from its full employment level it has been negative.

All things considered we estimate that dentists’ productivity in Australia is increasing by between 0.75 and 1.25 per cent on the longer term.

We are strengthened in this judgement by the behaviour of the main drivers of dentists’ productivity growth identified in this and other studies. These drivers, with the possible exception of hours worked per week, point towards increased dentists’ productivity.

5.3 Future drivers of dentists’ productivity growth

A number of drivers of dentists’ productivity growth in the past are highly likely to continue to drive dentists’ productivity growth in the future. Their influence has by no means been anything like exhausted. Three important ones are discussed below.

First, the equipment used chair side by dentists which embodies increasing digital and computer controlled elements is expected to improve both in its technical performance but also its price and capability. CAD/CAM dentistry, which has been around since the 1980s, is only now achieving significant penetration rates. The Dental Practice Survey by the ADA (2012), Provision of services by dental practices, strongly suggests that the clinical use of computers is likely to continue to rise. The industry that develops and manufactures dental capital equipment is growing and building up its technological capability to the ultimate benefit of dentists and their patients. It can be expected that this industry will be a direct and strong contributor to increasing dentists’ productivity in the future.

Second, while the employment of allied dental practitioners in dental practices is rising (according to the Dental Practice Survey: Financial aspects of private practice there has been a progressive increase in dental hygienists employed since
1997) it is still at a relatively low level in Australia compared to the US. Studies in the US have found a positive association between the increased use of allied dental practitioners and the productivity of dental practices. This suggests that this driver has considerably farther to run in Australia with beneficial results for dentists’ productivity.

Third, although the single dentist practice remains the biggest element of the employment of dentists there has been growth in group practices which have the potential to achieve higher levels of dentists’ productivity through better scheduling and sharing of capital equipment costs. Again, US experience suggests that Australia still has some way to go in this direction.

5.4 Barriers to dentists’ productivity growth

During the interviews with practicing dentists they were asked to identify any barriers they saw to increasing their productivity.

The main barrier identified was the increasing regulatory burden associated with accreditation and quality control. Dental practices are for the most part small businesses and, like other small businesses, they find that the costs of complying with increased regulatory requirements can be considerable. Reference was made in this regard to the National Safety and Quality Health Service Standards developed by the Australian Commission on Safety and Quality in Health Care that were introduced on a compulsory basis on 1 January 2013.

A case can be made that when new regulatory arrangements are introduced that action should be taken to increase the capability of dentists (and indeed any other businesses impacted by increased regulation imposed for social reasons) to meet the new obligations. Otherwise it is likely that they will be under pressure to divert scarce resources away from their main activity in order to comply with new regulatory requirements.

Two other barriers to increased productivity were also mentioned during the interviews: skills and leadership. These matters presumably both have implications for the education and training dentists receive in their University courses and practical work as well as post-graduate training and education. With technology changing reasonably rapidly it is important that dental schools are able to incorporate up to date technologies and methods in their course work.

At the end of the day, a dental practice is a business and as the size of practices increases the need for good leadership skills becomes increasingly important.

5.5 Suggestions for the ADA

The following five suggestions for approaching dentists’ productivity emerge from this study:

First, there is a need to acknowledge the fundamental weaknesses and limitations of the use of visits per dentist per year as a measure of dentists’ productivity. While simple to calculate, the measure by itself is not helpful and is a source of faulty thinking about the future supply-demand balance for dental services.
Second, develop a measure that incorporates to the greatest extent possible the services being provided by dentists. A start can be made by making appropriate allowance for the number of services being provided. It is expected that this will show that dentists’ productivity has increased over time. This is far more plausible than the implication of the stand alone visits measure, which suggests dentists’ productivity has been falling.

Third, devote a greater focus to the identified drivers of dentists’ productivity growth. This will involve matters such as the capital equipment employed by dental practices both chair side and in offices, the skills of dentists, the use of allied dental practitioners and business models/mix of types of practices.

It is noted that some of these aspects are addressed in the Dental Practice Survey: Provision of services by dental practices and the Dental Practice Survey: Financial aspects of private practice but not in the Dental Practice Survey: Productivity of dentists. One omission from the Dental Practice Survey is an estimate of the value of capital equipment used in dental practices and how this has been changing over time. One of our interviewees suggested that in his single dentist practice the value of capital equipment employed in the practice was about $250,000. Running a dental practice is a relatively capital intensive activity.

Fourth, identify and where possible address the barriers to increased productivity growth judged to be important by dental practitioners. The main elements identified in the interviews we held were the growing regulatory burden, skills and leadership.

Fifth, review the way the results of the Dental Practice Survey are presented to ensure that those elements which relate to the broader concept of dentists’ productivity and its drivers we are proposing are brought together in the one publication rather than spread between three publications as is now the case.
APPENDIX 1

References

ARCPOH 2006, Brennan DS and Spencer AJ, Dental Statistics and Research Series No 32, Practice activities patterns of dentists in Australia: trends over time by age of patients.


ARCPOH 2008 (2), AIHW Dental Statistics and Research Unit Research Report No 42, Projected demand for dental care to 2020, October.


